Annual Summary of the Pesticide Database for the period October 1, 2003 to September 30, 2004

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This summary of activities associated with the Nebraska Ground-water Pesticide Clearinghouse is submitted in fulfillment of a cooperative agreement between the Nebraska Department of Agriculture and the Board of Regents of the University of Nebraska.

The Database

The database currently contains 132,360 pesticide analyses for 4,137 wells. This is a 27% increase in the number of pesticide analyses and a 6% increase in the number of sampled wells since the last annual progress report.

During the last year 15 pesticide analytes were added to the database. The new analytes are measured by the USGS. To date 116 pesticides and pesticide degradates have been measured in Nebraska ground water. Table 1 contains the complete list of analytes.

This year 76% of the pesticide analyses added to the database were from irrigation (49%) and monitoring (27%) wells. Data from domestic wells still constitute a significant portion (35%) of the entire database; however, the proportion declines each year as more data are acquired from irrigation and monitoring wells (Figure 1). About 6% of the data are from public supply wells. Stock and industrial well data do not contribute significantly to the database.

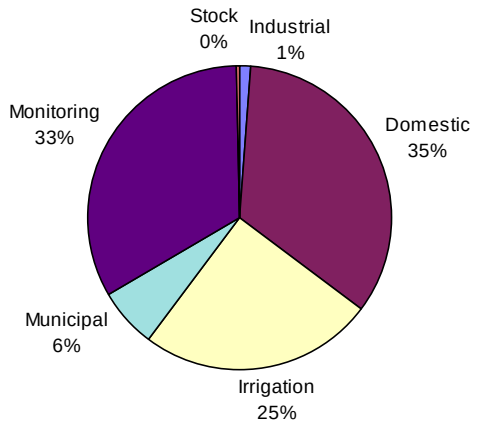

Figure 1. Distribution of the data by well use.

Figure 2 shows the relative contribution of each agency to the pesticide database. During the last year pesticide data from the USGS, the Nebraska Department of Agriculture, and natural resources districts were added to the database. In the past year the majority of the added data came from the Lower Platte South NRD, which submitted nearly 25,000 pesticide records from 1977-2003.

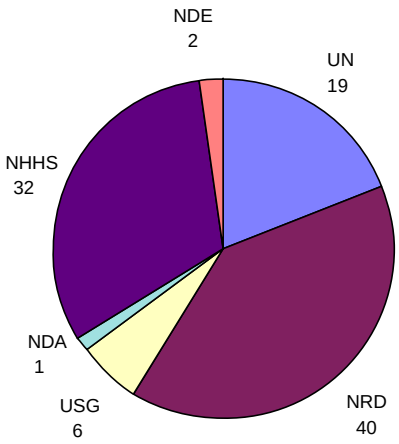

Figure 2. Sources of the pesticide data.

Twenty-two pesticides and four degradates have been detected in Nebraska ground water (Table 1). In the last year only isoxaflutole benzoic acid was added to the list of detected pesticides.

Atrazine remains the most frequently detected pesticide. Figure 3 shows the 2488 wells sampled for atrazine in the 10-year period from 1994-2003. Atrazine was detected in 12.7% of the wells. The atrazine degradates deethylatrazine (DEA) and deisopropylatrazine (DIA) were found in 33.0% and 5.0% of the wells in which they were measured, respectively. Alachlor, metolachlor and simazine were detected in 1.1%, 4.2% and 2.3% of the wells, respectively. The incidence of atrazine (21.5%) and metolachlor (7.3%) detections has increased in the most recent five-year period (1999-2003). At least some of the increase can be attributed to the marked decrease in domestic well data and the increase in monitoring and irrigation well data, especially in areas vulnerable to pesticide contamination. DIA (5.4%) and alachlor (1.8%) detections increased only slightly.

During the period 1994-2003, atrazine concentrations exceeded the 3 μg/L maximum contaminant level (MCL) in 0.6% of the wells; however, none of the atrazine concentrations exceeded the MCL during the latest 5-year period (1999-2003). In the period 1994-2003 there were no exceedances of the 2 μg/L alachlor MCL; the 1μg/L cyanazine health advisory (HA); the 100 μg/L metolachlor HA nor the 4 μg/L simazine MCL. There have been no new detections of carbon tetrachloride and methyl parathion both of which were detected only once and the concentrations exceeded the 5 μg/L MCL and the 2 μg/L HA,

respectively. Both incidences occurred more than 10 years ago. The concentrations of other detected pesticides with Health Advisories are at most one-tenth the HA level.

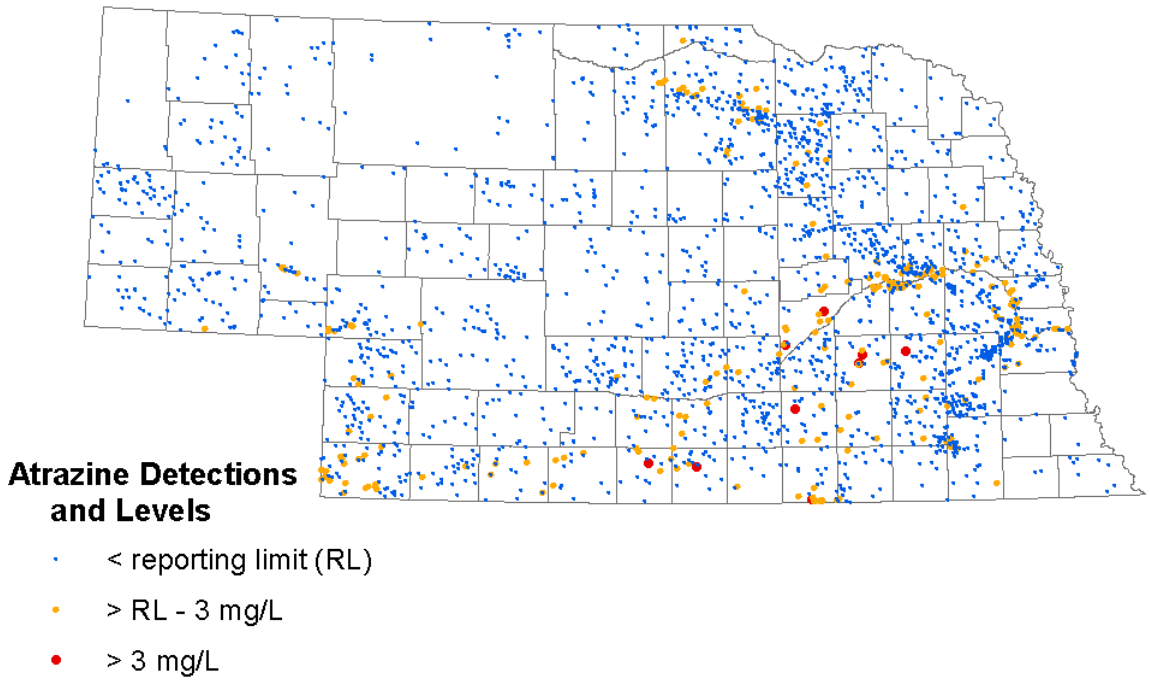

Figure 3. Locations and levels of atrazine in wells sampled, 1994-2003.

The majority of data added in the last year had a quality assessment level of 3 (Figure 4); however, most data for the last five years were Level 2 because of the absence of field quality control samples. Currently, collecting field duplicates is not a standard operating procedure for state and federal agencies and most natural resources districts.

Summary of 2004 Activities

During the last year the emphasis was on acquiring the remaining pre-2003 data from the NRDs and incorporating it and USGS 1995-2001 pesticide data into the database. The NRDs have been increasingly cooperative in providing the required information in a format that can be manipulated easily.

The supporting documentation accompanying the 2002-2003 isoxaflutole data submitted by NDA was complete and the data were entered into the database.

Updates of the database were released to DNR in October 2003 and February, June, and September 2004.

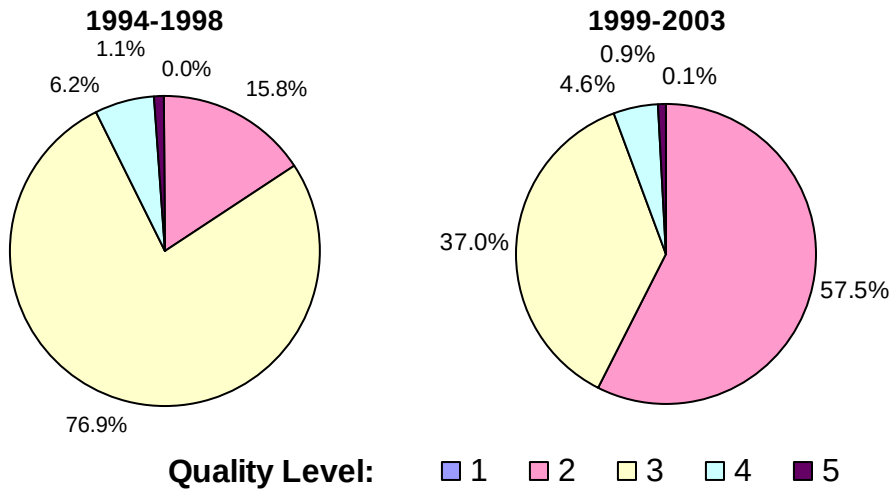

Figure 4. Percent of analyte data for each quality assessment level for the periods 1994-1998 and 1999-2003.

Future Activities

The website will continue to be updated quarterly, on a schedule that accommodates the influx of NRD data for NDEQ's annual report to the Legislature and ensures that the NDEQ report and year-end NDA reports are based on the latest available data. The database will be submitted to DNR in early October, January, April, and July for dissemination to the website. The metadata also will be reviewed and updated quarterly.

We will concentrate on acquiring, assessing, and incorporating 2002-2004 USGS data and the five years of Nebraska Management Systems Evaluation Area (MSEA) results into the database. In addition to incorporating the 2004 NRD data, we will verify that we have all available NRD pesticide data and their most recent Quality Assurance Plan.

Table 1. Pesticides measured in Nebraska ground water and the number of monitored wells in the database.

Pesticide	Number of Wells	Pesticide	Number of Wells
1,1,1-trichloroethane	3	diazinon	160
1,2,4-trichlorobenzene	3	dicamba	40
1,2-dibromo-3-chloropropane	3	didealkyl atrazine	18
1,2-dibromoethane	160	dieldrin	327
1,2-dichlorobenzene	3	dimethenamid	258
1,2-dichloroethane	3	diphenamid	99
1,2-dichloropropane	3	disulfoton	149
1,4-dichlorobenzene	3	endosulfan I	162
1-napthol	13	endosulfan II	162
2,4,5-T	41	endosulfan sulfate	162
2,4-D	62	endrin	358
2,6-diethylaniline	1	endrin aldehyde	162
acetochlor *	670	EPTC *	898
acrylonitrile	3	ethalfluralin	254
alachlor *	3444	ethion	1
aldicarb	13	ethoprop	1
aldicarb sulfone	13	ethyl parathion	2136
aldrin *	275	fonofos *	2820
alpha-BHC	163	gamma-BHC	164
ametryn *	620	heptachlor	275
atrazine *	3705	heptachlor epoxide	274
azinphos-methyl	1	hexachlorobenzene	112
benfluralin	216	hexachlorocyclopentadiene	112
beta-BHC	162	hexazinone	99
bromacil	99	isofenphos	70
bromomethane	3	isoxaflutole	558
butachlor	426	isoxaflutole benzoic acid *	558
butylate *	2843	isoxaflutole diketonitrile *	558
carbaryl	2289	lindane	197
carbofuran	2321	linuron	1
carbon tetrachloride *	160	malathion	40
carboxin	99	methiocarb	13
chlordane	232	methomyl	13
chloroform	3	methoxychlor	358
chlorpyrifos *	2650	methyl parathion *	2174
cyanazine *	3480	methylene chloride	3
cycloate	99	metolachlor*	3263
cyprazine	71	metribuzin *	3335
DCPA	11	molinate	1
DCPA mono and diacids	10	naphthalene	3
DDD	180	napropamide	1
DDE	181	parathion	136
DDT	180	pebulate	1
delta-BHC	162	pendimethalin *	618
deethylatrazine *	1035	permethrin *	365
deisopropylatrazine *	988	phorate	352

* Detected in at least one sample.

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Table 1. **(**Continued)

Pesticide	Number of Wells	Pesticide	Number of Wells
prometon *	1226	tebuthiuron	1
prometryn *	570	terbacil	100
propachlor *	1181	terbufos	2674
propanil	1	terbuthylazine	5
propargite	1	terbutryn	37
propazine *	1224	tetrachloroethene	3
propham	13	thiobencarb	1
propoxur	13	toxaphene	246
propyzamide	1	triallate	216
silvex	40	trichloroethene	3
simazine *	1324	trifluralin *	3198
simetryn	193	vernolate	99

* Detected in at least one sample